SUMMARY OF

CARDIO

INDEX

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Fracture ribs

TRAUMAS:
1) **FRACTURE RIB** → *blunt trauma.*
2) **PNEUMOTHORAX** → *blunt trauma except **open type** is penetrating.*
3) **HEMO-THX & CARDIAC TAMPONADE** → *blunt or penetrating*

	SIMPLE (ISOLATED)	FLAIL CHEST
DEF.	• Fracture **1 or more** ribs. • at **1 site only.**	• Fracture **3 or more** ribs. • **> 1 site** → creating a flail segment.
ETIOLOGY	• **Direct** → **Blunt trauma.** *(directed inwards → Visceral inj. is common)* • **Indirect** → Antero-post. Crush → fracture at angle. *(directed outwards → less visceral inj.)*	
C/P & COMPLICATIONS	**ORTHO SCHEME + ↑ Pain on breathing or coughing.** **"TENDERNESS ON FRACTURED RIB"**	1) Dyspnea, Cyanosis 2) Tachycardia. 3) Restlessness & confusion. **4) Engorged Neck veins.**
COMPLICATIONS	• Lung contusion + injury of br. plexus. • Pneumothorax, hemothorax. • Surgical emphysema. • Rupture spleen – liver.	3 Ps • **PARADOXICAL RESPIRATION → Diagnostic cl. sign.** • **PENDULAR RESPIRATION** → switch of gases bet. 2 lungs → ↑CO_2 in blood → hypoxia. • **PULM. CONTUSION (main COD) or Mediastinal flutter** (dt kink of great vs. → Cardiac arrest)
INVEST.	• **CXR** → diag. & exclude comp. • **Lower ribs** → Abd. U/S.	• **CXR** → fractured rib!
TTT.	**CONSERVATIVE : ANALGESICS** • **NSAID.** • IC nerve block. • Epidural analgesia.	• **ER. STRAPPING** "Elastoplast" → fix the flail segment. • **ETT + MECH. VENTILATION (PEEP)** for 2 wks. till healing. • **OR + IF → only if Thoracotomy** is indicated. (eg: lung contusion)

***Stove in chest** = Flail chest but the flail segment is sucked & fixed over the lung → lung laceration.*

	Empyema Thoracis		Hemothorax	Pneumothorax		
Def.	Accumulation of **Pus** in the pleura.		Accum. of **Blood** in pleura.	Accumulation of **Air** in the pleura.		
Types	Acute	Chronic	**Pathology?! see below**	Simple	Open	Tension
Etiology	• **M/C cause** → on top of pneumonia. • **M/C org.** → **pneumo-cocci, Staph. & Strept.? How to diff. see last p.!** • **Local** → pyogenic lung or liver ds. • **Septicemia, pyemia.**	**1) Mis-management of Acute empyema:** • **Faulty drainage:** → Too late or too low. (blocked by diaph.) → Too high drainage. (independent area) • **Inadeq.** post-op. care. **2) Underlying chest ds.** (Lung Abscess - OM of rib)	• **Traumatic** → closed or penetrating. • **Post-op.** → cardiac, esoph, pulm, central venous line. • **Path** → Tumor, leaking aneurysm.	• **Traumatic** → Blunt trauma. • **Spont.** → Rupture emph. bulae /TB cavity. • **Iatrogenic** → ETT or Insertion of central venous line.	**(Sucking Chest Wound)** **Peneterating trauma** *"Communication bet. pleural space & atmosph. → air enters during insp. 7 comes out during exp. → lung collapse"*	**Blunt or penetrating trauma** ↓ Comm. bet. lung & visceral pleura with a valve like action
C/P						
Sympt.	• **Toxemia. (FAHM-R)** • Hx. of chest inf. • Chest Pain & dyspnea.	**Sinus discharging pus (خرم)**	Chest pain & Dyspnea	Chest pain & Dyspnea	• Dyspnea, cyanosis. • Restleness, Confusion. • Tachycardia, Shock.	as (open) + **ENGORGED NV**
Signs	**as Hemothorax**	**Signs of Fibrosis:** • Crowding of ribs. • Elevation of diaph. • Shifted mediastinum to the affected side.	• ↓ Chest mov. • ↓ TVF. • **Dullness.** • ↓ Air entry. • **± Shifted mediast if massive!**	• ↓ Chest mov. • ↓ TVF. • **Hyper-resonance.** • ↓ Air entry.	**The same + :** • **Harsh noisy sound of air through ! defect.** • **Shifted mediastinum** to the opp. side.	**As Open**
Comp.	**Septicemia, pyemia, spread to the surr. +** **"Empyema Necessitans"** *SC abscess with expansile impulse on cough... necessary for drainage.*	**Broncho-pleural Fistula**	**Hypovolemic shock** if massive.		**As flail chest**	• Lung collapse. • **Main COD → Electro-mech. dissociation & Cardiac arrest**

Empyema		Hemothorax	Pneumothorax		
Acute	**Chronic**		**Simple**	**Open**	**Tension**
Investigations: • **CXR & CT** → as hemothorax + underlying path. • **IC aspiration** → pus. • CBC → leukocytosis.	• **CXR** → Signs of fibrosis. • **CT scan** → underlying path. • **Pleurogram** → site & size sinus.	• **CXR** → obliteration of costo-phrenic angle. • **CT scan chest.** • **IC aspiration** → blood.	**CXR**: jet black opacity.	**Same +** **MEDIASTINAL SHIFT**	**Clinically diag.** **Same but its an ER** ↓ **NO TIME FOR CXR**
Treatment					
• Thin pus → **Aspiration.** • **IC tube (as scheme) if:** a) Bilateral. b) Rapid re-accumulation. c) Thick pus. • **Decortication** if fibrosed & multi-loculated → **Open drainage "Thoracitimy".**	• **Re-drainage by IC tube.** • **Decortication** if failed dt fibrosis. • **Pleuro-lobectomy** of the underlying ds.	1) **IC tube. (as scheme)** 2) **Open Thoracotomy & ligation of ! bleeding vs.?** a) **Massive:** • **>1500 ml** • >200 ml/h for 4hrs. • >100 ml/h for 8hrs. b) **Clotted, loculated, others!** 3) **Decortication if fibrosis!**	**Small amount** → spont. absorp. **Large amount** → **IC tube** (as scheme)	**ER convert it to Closed pneumothx.** 1) **1st line = Adhesive ext. dressing** *on 3 of it's sides (Vaseline gause) to stop the flow of air through the defect.* 2) **Then IC tube.** 3) **Wound repair.**	**Decompression** **Thoraco-centesis** **Wide bore cannula 2nd IC space MCL** ↓ **IC tube.** (as scheme)

Pathology of Hemo-thx

1) *Bleeding is minimal dt low pr. area → stops spont.*
2) ***Blood is Never absorbed spont.***
→ Defrbrination → clotting
→ org. & fibrosis of the pleura
→ interferes with pleural mov.

Scheme for IC tube

Insertion

(Closed Thoracotomy)

- 5^{th} IC space MAL under water seal.
- Inserted above the upper border of ribs. *(to avoid injury of vs & ns.)*

Care of the IC Tube

1) **Must be Oscillating.**
2) **Follow up** daily by CXR → Removal of pleural air+ lung exp.
3) **B4 removal** → Clamping for 24 hrs. to asses recurrence.
4) **Removed** during full inspiration.
5) **Purse string** suture is closed quickly.

PULMONARY EMBOLISM

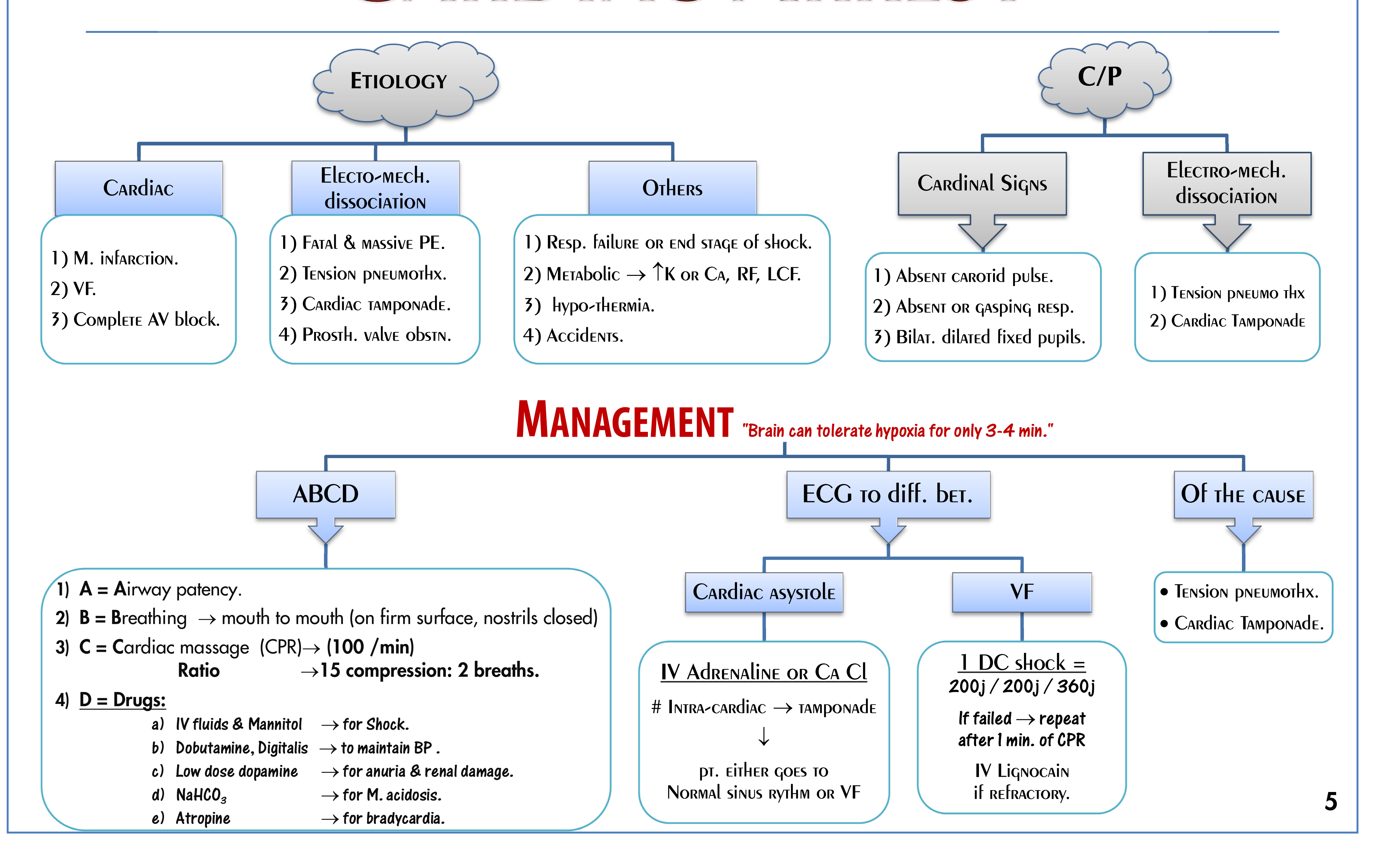
- Occurs with in the 1st 10 days after DVT.
- 30 % Post-operatively
- Majority are lysed in situ.

	FATAL PE	MASSIVE PE	INFARCTION
PATHOLOGY	Main pulmonary trunk	1 of its major branches	Brs. of pulmonary artery
CL./P	**SUDDEN DEATH dt** electro-mech. diss. **M/C SOURCE:** ileac v. thrombosis.	• Sever Pain. • Sever Dyspnea, Cyanosis. • Tachycardia, Hypotension. • Death with in mins.	• **Pleuritic Pain.** • Dyspnea, Cyanosis. • Hemoptysis. • **FUO.**
INVEST.	**LAB** 1) **ABG** → hypoxic / normo-capnic. (N) in 50% of pts. 2) **ECG** 3) **LAB** → leucocytosis, ↑LDH	**RADIO** 4) **CXR** → ↓ BVM – RV++ 5) **V/P** → Defective (P) / Normal (V) (time consuming!) 6) **Pulm. angio** → filling defect (invasive!) 7) **MOST DIAG. → SPIRAL / TRIPHASIC CT scan**	
TTT.		**Catheterization in PA + either:** • Suction Embolectomy. • Thrombolytics IA inj. **(Strepto-kinase)**	1) **Heparin** → (vascular for details!) 2) **IVC filter in case of:** • Recurrent Showers of emboli. } Absolute indication • # of Heparin. } • High risk pts. eg cardiac. (relative) **Lytic therapy is given only if the pt. is hemo-dynamically unstable! & NEVER GIVEN AFTER SURGERY!**

Showers of emboli.
- Periodic attacks of dyspnea.
- Fever.

↑↑ LDH in:
1) Testicular tumors.
2) Leukemia - Lymphoma.
3) Pancreatitis.
4) PE.

Cardiac Arrest



CARDIAC TAMPONADE

- **DEF:** bleeding into the pericardium → compresses the heart → prevents diastolic filling → ↓ COP.
- **ETIOLOGY** → **BOTH:** Blunt or penetrating trauma.
- **AMOUNT** → **150 ml** inside the pericardium.
- **CL./P:**
  - **BECK'S TRIAD → ↑ CVP (engorged NV) / ↓BP / ↓ HS**
  - **PULSUS PARADOXUS** → ↓ SBP > 10 mmHg with inspiration.
  - **KUSSMAUL'S SIGN** → ↑venous pr. on inspiration.
- **INVEST.** → Emergent **Echo.**
- **TREATMENT:**
  1) CPR + **Immediate Pericardiocentesis** of 20 ml of blood.
  2) Open **pericardiotomy** & suturing the underlying tear.

NB: Open cardiac massage isn't done now!!

MISCELLANEOUS

1) M/C **1^{ry} malignant** tumor in **ribs** → Chondro-sarcoma.
   But the M/C in general → 2^{ries}.
2) Fracture involving the **1^{st} rib** → underlying **major** injury.
3) Blood in the pericardium → **globular** form.
4) **Tracheal disruptions** are immediate life threatening injuries that can obstruct air exchange → **No 1^{st} aid.**
5) **Safety margin in rib tumors:**
   Benign = 2cm. **Malignant = 4 cm.**
6) Thoracocentesis → **decompression of pleural space.**
7) Drainage of the IC tube occurs **during Expiration (+ve pleural. pr.)**

How to diff. bet Pneumococcal & Strept. empyema?

PNEUMO-COCCAL EMPYEMA	STREPT. EMPYEMA
• **AFTER** the attack.	• **DURING** the attack.
• **THICK greenish pus.**	• **THIN** yellowish pus.
• **EARLY** Fibrosis.	• **NO OR LATE** fibrosis.
• **Bad prognosis.**	